CLAIMS

1. A power system comprising: an electrochemical
device; a load device; a power generator; and a
charge/discharge controller of said electrochemical device,

said electrochemical device comprising a positive
electrode, a negative electrode, and a liquid electrolyte
or a solid electrolyte,

said electrochemical device having a
charge/discharge curve that has at least one step, a given
step of said at least one step having an inflection point,
a voltage corresponding to the inflection point or a point
adjacent to the inflection point being set as a threshold
value, and

said charge/discharge controller being configured
to control charge/discharge of said electrochemical device
such that the voltage of said electrochemical device
approaches said threshold value.

2. The power system in accordance with claim 1,
further comprising: a comparator that compares the voltage
of said electrochemical device with said threshold value,

wherein based on an output of said comparator,
said charge/discharge controller causes said
electrochemical device to be charged when the voltage is
lower than said threshold value and causes said
electrochemical device to be discharged when the voltage is

higher than said threshold value.

3. The power system in accordance with claim 1, further comprising: a comparator that compares the voltage of said electrochemical device with said threshold value; and a remaining capacity detector that calculates a remaining capacity of said electrochemical device based on an output of said comparator,

wherein based on an output of said remaining capacity detector, said charge/discharge controller charges said electrochemical device when the remaining capacity is less than the remaining capacity corresponding to said threshold value and discharges said electrochemical device when the remaining capacity is greater than the remaining capacity corresponding to said threshold value.

4. The power system in accordance with claim 1, wherein said threshold value is set to a voltage range in which the remaining capacity of said electrochemical device is 80 to 90 % of a nominal capacity.

5. The power system in accordance with claim 1, wherein when a maximum discharge capacity is defined as 1, an absolute value of the rate of change of voltage (V) relative to capacity: $\Delta V/\Delta C$ has a maximum value of 1 to 10 in said step.

6. The power system in accordance with claim 1, wherein said charge/discharge controller controls charge/discharge of said electrochemical device such that

at least a part of a difference between an amount of power generated by said power generator and an amount of power consumed by said load device is supplied or stored.
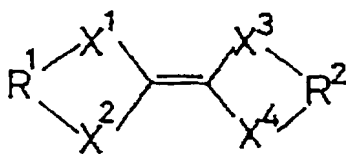
7. The power system in accordance with claim 6, wherein said charge/discharge controller further comprises a power difference determining unit that determines a difference between an amount of power generated by said power generator per unit time and an amount of power consumed by said load device per unit time, and

based on an output of said power difference determining unit, said charge/discharge controller controls charge/discharge of said electrochemical device while controlling the amount of power generated by said power generator per unit time.

8. The power system in accordance with claim 1, wherein said electrochemical device is charged by utilizing regenerative energy from said load device.

9. The power system in accordance with claim 1, wherein at least one selected from said positive electrode and said negative electrode comprises a compound having a structure represented by the general formula (1):

[Chemical formula 1]

$$R^1 \overset{X^1}{\underset{X^2}{<}} = \overset{X^3}{\underset{X^4}{>}} R^2$$

where each of R^1 and R^2 is independently a chain or cyclic aliphatic group, R^1 and R^2 may be the same or different, each of X^1 to X^4 is independently a sulfur atom, an oxygen atom or a tellurium atom, X^1 to X^4 may be the same or different, and said aliphatic group may contain one or more selected from the group consisting of an oxygen atom, a nitrogen atom, a sulfur atom, a silicon atom, a phosphorus atom and a boron atom.

10. The power system in accordance with claim 2, further comprising: a parameter detector that detects at least one parameter selected from the group consisting of charge/discharge current, temperature and internal impedance of said electrochemical device; and a field adjustor that adjusts the relation between the voltage of said electrochemical device and said threshold value based on the detected parameter.

11. The power system in accordance with claim 3, further comprising: a parameter detector that detects at least one parameter selected from the group consisting of charge/discharge current, temperature and internal impedance of said electrochemical device; and a field adjustor that adjusts the relation between the voltage or remaining capacity of said electrochemical device and said threshold value based on the detected parameter.

12. The power system in accordance with claim 3, wherein said remaining capacity detector resets the

remaining capacity of said electrochemical device to a predetermined value corresponding to said threshold value when it determines the voltage of said electrochemical device to be equal to said threshold value.

13. The power system in accordance with claim 12, wherein said remaining capacity detector comprises: a step detector that detects, based on the voltage of said electrochemical device, that said electrochemical device has a remaining capacity close to a remaining capacity corresponding to said step; a current integrator that performs current integration near said step; and a corrector that corrects the remaining capacity of said electrochemical device based on a scale of the step that is determined from a current integral near said step.

14. The power system in accordance with claim 3, wherein said remaining capacity detector comprises: a step detector that detects, based on the voltage of said electrochemical device, that said electrochemical device has a remaining capacity close to that corresponding to said step; and a current integrator that performs current integration near said step, and

wherein said remaining capacity detector resets the remaining capacity of said electrochemical device to a predetermined value corresponding to said threshold value when it determines the rate of voltage change relative to capacity change: ΔC obtained by current integration:

$\Delta V / \Delta C$ to be equal to $\Delta V / \Delta C$ at the threshold value that has been predetermined depending on charge/discharge current.

15. The power system in accordance with claim 14, wherein said remaining capacity detector has a corrector that corrects the remaining capacity of said electrochemical device based on a scale of the step that is determined from a current integral near said step.

16. A method for managing a power system that comprises an electrochemical device, a load device, and a power generator,

said electrochemical device comprising a positive electrode, a negative electrode, and a liquid electrolyte or a solid electrolyte,

said electrochemical device having a charge/discharge curve that has at least one step, a given step of said at least one step having an inflection point, a voltage corresponding to the inflection point or a point adjacent to the inflection point being set as a threshold value, and

said method comprising controlling charge/discharge of said electrochemical device such that the voltage of said electrochemical device approaches said threshold value.

17. The method for managing a power system in accordance with claim 16, wherein said controlling

charge/discharge comprises the steps of:

measuring a voltage of said electrochemical device;

comparing the measured voltage with said threshold value; and

charging said electrochemical device when the measured voltage is lower than said threshold value and discharging said electrochemical device when the measured voltage is higher than said threshold value.

18. The method for managing a power system in accordance with claim 16, wherein said controlling charge/discharge comprises the steps of:

measuring a voltage of said electrochemical device;

comparing the measured voltage with said threshold value;

calculating a remaining capacity of said electrochemical device based on said compared result; and

charging said electrochemical device when the remaining capacity is less than the remaining capacity corresponding to said threshold value and discharging said electrochemical device when the remaining capacity is greater than the remaining capacity corresponding to said threshold value.

19. The method for managing a power system in accordance with claim 18, further comprising the step of

resetting the remaining capacity of said electrochemical device to a predetermined value corresponding to said threshold value when the voltage of said electrochemical device is determined to be equal to said threshold value.

20. The method for managing a power system in accordance with claim 18, further comprising the step of performing current integration near said threshold value and resetting the remaining capacity of said electrochemical device to a predetermined value corresponding to said threshold value when the rate of voltage change relative to capacity change: ΔC obtained by the current integration: $\Delta V/\Delta C$ is determined to be equal to $\Delta V/\Delta C$ at said threshold value that has been predetermined depending on charge/discharge current.